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FOREST INSECT INVESTIGATIONS

LODGEPOLE NEEDLEMINER DEMONSTRATION CONTROL AND EXPERIMENTAL WORK
PROGRESS REPORT - To July 30, 1935

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Porcupine Flat
Yosemite National Park
July 30, 1935

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General statements of the work now completed or under way on this project follow. Acknowledgement is made of the interested and helpful co-operation of the National Park Service and CCC personnel that, in many ways, has been of great value in carrying this project to its present state of development.

Demonstration Control

Plots

Fourteen plots, to be used in extensive field tests of sprays, have been laid out, surveyed and mapped. Some work remains to be done on this phase of the project before a master map is made. These plots sample different types of stands and varying degrees of infestation.

Tests of Equipment

Guns and nozzles available for the field work have been tested. Conditions were standardized as much as possible but wind, which was a variable factor, accounted for some discrepancies in the observations. However, the results secured are sufficient for practical purposes. At low pressure (200 lbs. at the pump) all three guns, and all nozzle apertures threw a spray that was too coarse for field work. About 500 pounds pressure at the pump appears to be the optimum working pressure. Above 500 pounds, the extra height obtained and the greater feathering of the stream was more than offset by the extra strain on the equipment.

As was expected the Worthley gun reached higher than did the Bean or Hardie. However, the Bean threw a more finely divided spray, reached slightly lower with the same nozzle equipment and has the additional features of adjustable feathering or coning of the spray for small trees and an automatic shutoff. These features should prove valuable in spraying uneven aged stands and in saving materials. The Hardie gun, which is equipped only with a 1/4" nozzle aperture gave a much coarser spray and was the least effective of the three guns tested. It was found impossible to use two guns with 1/4" aperture at the same time on two lines of hose. Pump pressure was reduced from 575 lbs. to 225 lbs. when both guns were in use.

Sprays

It is not yet time to apply ovicidal sprays in the extensive field tests. It is expected this work will start soon after the fifth of August.

Experimental Work

Timing of Sprays

Several methods have been tried for use as aids in timing the application of sprays to the plots. Infested needles, taken at random, have been segregated and the emergence from them counted. 30.68% of the adults have emerged. If a mortality of 30% due to handling and parasitism is assumed arbitrarily, emergence at an altitude of 7900 feet is about half completed.

Samples of adult populations, secured by a stated number of sweeps with an insect collecting net on a stated number of trees have shown indications of the increasing population. This method appears to be more valuable in indicating the relative numbers of moths in different areas except where populations are small. In such areas disturbance of foliage and observations of the numbers of adults is used as an index.

Baits, consisting of fermenting molasses and malt mixtures and pure pine oils have been tested to determine if their attraction of numbers of moths would give indication of the population in flight. The results have shown no particular attraction to any bait and such catches as have been made appear to have been due to chance.

It was hoped adults might be attracted to differently colored lights exposed at night. Preliminary tests appear to indicate no index of population density is secured by this method.

Experimental Control

Sprays of different materials were tried in an effort to determine their effects on the pupal stage and subsequent emergence. These results, not yet completed, indicate some sprays accelerate emergence while others either retard emergence or exert some control.

In order to test the ovicidal qualities of different sprays, attempts have been made to secure a supply of eggs by allowing moths to oviposit on paper. This method, which has been used extensively for this purpose on other lepidopterous insect pests, gave negative results when used on the lodgepole needleminer.

Other attempts are being made to induce oviposition on lodgepole needles In a few days examinations will be made of the cages, 36 of which now are in operation.

The above attempts failing to obtain a supply of eggs for experimental work on the toxicity of sprays to the egg stage, sprays will be applied directly to trees in the field. At later dates the incidence of infestation on those trees will be determined by counts. However, it is not expected that this method will yield quantitative results permitting the drawing of definite conclusions.

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Yosemite National Park,
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